

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-6 have been considered but are not persuasive. Therefore rejection of said claims is maintained.

#### **Applicant argues that**

The disclosure of Kuhara, an opening of a light entrance portion is not formed in the substrate 11 in Fig. 3, even though a semiconductor crystal layer 12 and a first region 13 are formed in the substrate 11. Applicants respectfully submit that Kuhara does not disclose any such openings, even though the Examiner points out Fig. 2 and column 5, lines 43-47 of Kuhara in this regard. As a result, the rejection in the Office Action is based on a factual misconception of the disclosure of Kuhara.

Applicants respectfully submit that because such an opening is not formed in the substrate 11, a carrier capturing portion such as that disclosed in the instant application's invention is not necessary in the disclosure of Kuhara. As a result, Applicants respectfully submit that a carrier capturing portion is not formed in the substrate 11 of Kuhara.

#### **Examiner responds that:**

Kuhara (prior art of record) teaches substrate 11 with region 13 where a light enters into the said substrate as disclosed in Fig. 3 and further described in column 6, lines 50-65).

#### **Applicant argues that:**

Kuhara does not disclose, or even suggest, a carrier capturing portion capturing carriers that are generated between a photodetecting element array and a light entrance portion, as specifically recited in the claims of the instant application.

Applicants respectfully submit that Kuhara discloses that a photodiode chip includes a region for capturing unnecessary carriers. See col. 10, lines 6-8 of Kuhara. However, Applicants respectfully submit that Kuhara does not provide any disclosure or suggestion of where such a region is formed. On the other hand, the carrier capturing portion that is included in the advantageous combinations of features described in the claims of the instant application is specifically claimed as being disposed between the photodetecting element array and the light entrance portion. Applicants respectfully submit that the additionally applied reference to Jung does not cure the above-described deficiencies of Kuhara.

**Examiner responds that:**

Kuhara (prior art of record) teaches a sensor comprising a photodiode chip 1C (a carrier capturing portion) for monitoring the signal generated by the light signal 1A on said sensor (column 5, lines 30-40; Fig.8)

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuhara et al. (US Patent # 5,542,018) [hereinafter Kuhara] in view of Jung et al. (US 2003/0197855 A1) [hereinafter Jung], both previously cited.**

As to claim 1, Kuhara teaches a photodetector comprising: a substrate (11, Fig.3); a photodetecting element, having a photodetecting (column 5, lines 31-32) element formed on the substrate; a light entrance portion, being used to make light, to be detected by the photodetecting elements, enter and including an opening formed in the substrate in a predetermined positional relationship with respect to the photodetecting element (Fig.2; column 5, lines 43-47); and a carrier capturing portion, being disposed between the photodetecting element and the light entrance portion, capturing carriers generated when light is illuminated onto a substrate portion near the light entrance portion, and removing the carriers to the exterior (column 5, lines 34-36; column 10, lines 6-8).

Kuhara is silent to the photodetecting element being a photodetecting array.

Jung teaches an apparatus and method for measuring optical characteristics of

an object utilizing a photodiode array sensor to measure broadband visible and infrared light (paragraph 0231).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a photodetecting array sensor to the invention of Kuhara in order to measure broadband light at various wavelengths.

As to claim 2, Kuhara in view of Jung teaches all as applied to claim 1, and in addition Kuhara teaches wherein the substrate has a first conductive type substrate and a second conductive type epitaxial layer, formed on the first conductive type substrate, and has channel regions, functioning as the photodetecting elements, formed in the epitaxial layer (17, 19, Fig.11; column 6, lines 1-13; column 5, lines 55-57).

As to claim 3, Kuhara in view of Jung teaches all as applied to claim 1, and in addition Kuhara teaches wherein the substrate has a first conductive type substrate and a second conductive type well region, formed in the first conductive type substrate, and has channel regions, functioning as the photodetecting elements, formed in the well region (17, 19, Fig.11; column 6, lines 1-13; column 5, lines 55-57) , and the carrier capturing portion is arranged from a region portion of the second conductive type well region that is located between the photodetecting element array and the light entrance portion (column 5, lines 34-36; column 10, lines 6-8).

As to claim 4, Kuhara in view of Jung teaches all as applied to claim 1, and in addition Kuhara teaches wherein the substrate has a first conductive type substrate, has channel regions, functioning as the photodetecting elements, formed in the first conductive type substrate (17, 19, Fig.11; column 6, lines 1-13; column 5, lines 55-57) ,

and has a dummy channel region in a substrate portion of the first conductive type substrate that is located between the photodetecting element array and the light entrance portion, and the carrier capturing portion is arranged from the dummy channel region (column 5, lines 55-62; and note that said photodetecting element has a region whereby the signals generated in the region do not follow to the detector).

As to claim 5, Kuhara in view of Jung teaches all as applied to claim 1, and in addition Kuhara teaches wherein an electrode for removing the captured carriers to the exterior is connected to the carrier capturing portion (column 7, lines 2-4).

As to claim 6, Kuhara in view of Jung teaches all as applied to claim 1. Kuhara in view of Jung is silent to the dispersive element positioned with respect to the photodetector at a predetermined position along an optical path from the light entrance portion to the photodetecting element array. Examiner takes Official Notice of the fact that use of dispersive element is well known in the art of optics to separate light into its respective wavelengths, thereby enhancing resolution.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate a dispersive element to the invention of Kuhara in view of Jung in order to separate light into its respective wavelengths, thereby enhancing resolution.

### **Conclusion**

Several facts have been relied upon from the personal knowledge of the examiner about which the examiner took Official Notice. Applicant must seasonably challenge well known statements and statements based on personal knowledge when

they are made by the Board of Patent Appeals and Interferences. In re Selmi, 156 F.2d 96, 70 USPQ 197 (CCPA 1946); In re Fischer, 125 F.2d 725, 52 USPQ 473 (CCPA 1942). See also In re Boon, 439 F.2d 724, 169 USPQ 231 (CCPA 1971) (a challenge to the taking of judicial notice must contain adequate information or argument to create on its face a reasonable doubt regarding the circumstances justifying the judicial notice). If applicant does not seasonably traverse the well-known statement during examination, then the object of the well known statement is taken to be admitted prior art. In re Chevenard, 139 F.2d 71, 60 USPQ 239 (CCPA 1943). A seasonable challenge constitutes a demand for evidence made as soon as practicable during prosecution. Thus, applicant is charged with rebutting the well-known statement in the next reply after the Office action in which the well known statement was made."

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Abdullahi Nur whose telephone number is **571 270 1298**. The examiner can normally be reached on Monday through Friday, 8am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tarifur Chowdhury, can be reached on **571 272 2287**. The fax phone number for the organization where this application or proceeding is assigned is **571 273 8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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